SECTION C : ENGINEERING, ARCHITECTURE AND SURVEYING

C - 01

PROCESSING OF COIR DUST AS A FUEL

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Coir Dust has no known use. The Fibre Industry in Sri Lanka produces about 150,000 t, of this waste yearly.

Chemically, dry coir dust consists of about 60% lignin, 30% cellulose and 10% ash and its gross heat value is about 20 MJ/kg. However coir dust as discharged from the Fibre Mill, has a moisture content (m.c.) of about 85%. The conventional thermal drying of wet coir dust to produce a fuel is not viable due to adverse heat balance. Further, the dry product has a density of only 80 kg/m^3 and hence is not economical to transport.

A mechanical expeller was developed to squeeze coir dust to 50% m.c. from original 85% m.c. A solar drying system was developed to dry the expelled coir dust from 50% to 15% m.c. using solar energy and forced ambient air. Experiments were conducted using three makes of briquetting machines and briquettes of 1,200 kg/m^3 density were produced successfully.

The machinery for expelling drying and briquetting processes were designed for the production of 4,000 kg of briquettes in an 8-hour day. The electrical energy consumption by all the machinery in the process line is about 2,000 MJ/day and the heat value of the day's produce is about 70,000 MJ.

The use of this process to convert islandwide out-put of coir dust will yield briquettes with 3,000 TJ of fuel value or 150 GWh electrical replacement units yearly. This could, for example, meet more than 50% of the fuel requirement of the tea industry.